

PATENT

Att. Dkt. No. 003493.00360 (ATT/2001-0335)

**REMARKS**

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

**I. REJECTION OF CLAIMS 1-38 UNDER 35 U.S.C. §103****A. Claims 1, 5-7, 9, 20-34 and 36**

The Examiner has rejected claims 1, 5-7, 9, 20-34 and 36 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner, et al. (US Patent 6,735,553, issued July 19, 2005, hereinafter referred to as "Frogner."). The Applicants respectfully traverse the rejection.

Frogner teaches the use of model calibration to achieve high accuracy in analysis of computer networks. Frogner uses a data capture engine to collect data. (See Frogner, col. 5, ll. 36-50.) The frequency at which the data capture engine collects data may be adjusted. (See *Id.* at ll. 55-61.) The collected data may then be used by a prediction engine to create probability distributions for predicting network load and delay conditions. (See Frogner, col. 6, ll. 54-57.)

The Examiner's attention is directed to the fact that Frogner fails to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by Applicants' independent claim 1. Specifically, Applicants' independent claim 1 positively recites:

1. A method for managing a data network, comprising the steps of:
  - receiving an object, wherein the object is characterized by at least one attribute and wherein the object comprises at least one data element;
  - determining whether to sample the object in accordance with a probabilistic parameter;
  - sampling the object in response to said determining step; and
  - processing the sample in response to said sampling step. (Emphasis added.)

The Applicants' invention teaches a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

with a probabilistic parameter. Namely, the Applicants' invention uses a probabilistic parameter that determines the probability that a given flow will be sampled. (See Applicants' specification, e.g., paragraph [42].) The value of  $z$  can be set to achieve the desired accuracy or traffic volume. (See *Id.*) The parameter  $z$  acts as a threshold: flow of size  $z$  or above are always sampled as shown in Figure 2. (See *Id.* at paragraph [41].)

In contrast, Frogner completely fails to make obvious Applicants' invention. Frogner only teaches that the sampling frequency may be adjusted for the data capture engine. (See Frogner, column 5, line 51 to column 6, line 4.) In fact, Frogner discloses that the sampling frequency is premised on the sensitivity of the network, which is defined as the effect of collection of network data through network queries. The Applicants respectfully submit that this is not the same as the probabilistic parameter claimed by the Applicants' invention. For example, a flow with size  $x$  is sampled with probability  $p_z(x)$ . In one embodiment, the parameter  $z$  may act as a threshold, e.g., flow of size  $z$  or above are always sampled as shown in Figure 2. (See e.g., Applicants' specification at paragraph [41].) Applicants respectfully submit that the sensitivity of the network as disclosed by Frogner is not a probabilistic parameter. It appears that Frogner is simply teaching the use of collected data via network queries to calculate a sampling rate.

In addition, it appears that the Examiner is asserting that Frogner teaches the probabilistic parameter simply because Frogner mentions the term "probabilistic" in the Abstract. However, the Applicants respectfully submit that Frogner only teaches the use of a "probabilistic representation", which Frogner teaches is simply a probability distribution of the collected data to create a network performance prediction model. (See Frogner, col. 6, ll. 54-57.) Notably, the "probabilistic representation" as taught by Frogner is clearly not the same as the probabilistic parameter used for determining whether to sample an object or not, as taught by the Applicants' invention. As such, Frogner does not make obvious Applicants' independent claim 1.

Furthermore, dependent claims 5-7, 9, 20-34 and 36 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claims 5-7, 9, 20-34 and 36 are

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

also patentable and are not made obvious by Frogner. As such, the Applicants respectfully request the rejection be withdrawn.

**B. Claims 2-4, 10, 12, 13 and 35**

The Examiner has rejected claims 2-4, 10, 12, 13 and 35 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner in view of Muratani, et al. (U.S. Patent 6,119,109, issued September 12, 2000, hereinafter referred to as "Muratani"). Applicants respectfully traverse the rejection.

The teachings of Frogner are discussed above. Muratani teaches an information distribution system and billing system used for the information distribution system. The information distribution system comprises a billing processor. (See Muratani, Abstract.) The information comprises a content, billing attribute data including a billing method and a settlement method and correspondence information. (See *Id.*) When a request is made from the user, the information distribution system retrieves the content which meets the request and transfers a request to the billing processor to perform the billing process. (See *Id.*)

The Examiner's attention is directed to the fact that Frogner and Muratani, alone or in any permissible combination fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 1. (See *supra.*) As discussed above, Frogner only teaches using a sampling frequency that is premised on sensitivity of a network. Moreover, Muratani fails to bridge the substantial gap left by Frogner. Muratani only teaches retrieving and processing billing information only when a request is made from a user. (See Muratani, Abstract.) Therefore, the combination of Frogner and Muratani fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 1.

Consequently, the Applicants submit that claim 1 would not be made obvious by the teaching of Frogner in view of Muratani, and therefore is patentable under 35 U.S.C. § 103. Since claims 2-4, 10, 12, 13 and 35 depend, either directly or indirectly, from

PATENT

Atty. Dkt. No. 003493.00380 (ATT/2001-0335)

claim 1 and recite additional limitations, the Applicants submit that claims 2-4, 10, 12, 13 and 35 are also not made obvious by the teaching of Frogner in view of Muratani. Therefore, the Applicants submit that claims 2-4, 10, 12, 13 and 35 also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder. As such, the Applicants respectfully request the rejection be withdrawn.

C. Claim 8

The Examiner has rejected claim 8 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner in view of McCloghrie, et al. (US Patent 6,920,112, issued July 19, 2005, hereinafter referred to as "McCloghrie."). The Applicants respectfully traverse the rejection.

The teachings of Frogner are discussed above. McCloghrie teaches sampling packets for network monitoring. A traffic management element is coupled to substantially all of the input interfaces and output interfaces and is disposed to receive substantially all of the packets input to the packet switch and to sample a fraction of those packets. (See McCloghrie, col. 3, ll. 30-41.) The sample is performed by selecting a control parameter N. (See McCloghrie, col. 4, ll. 41-54.) Thus, one out of every N packets is selected by the sampling element for further processing by the traffic management element. (See *Id.*)

The Examiner's attention is directed to the fact that Frogner and McCloghrie, alone or in any permissible combination fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 1. (See *supra*.) As discussed above, Frogner only teaches using a sampling frequency that is premised on a sensitivity of the network. Moreover, McCloghrie fails to bridge the substantial gap left by Frogner. McCloghrie only teaches that the sampling is performed by selecting a control parameter N. (See McCloghrie, col. 4, ll. 41-54.) Thus, one out of every N packets is selected by the sampling element for further processing by the traffic management element. (See *Id.*) Therefore, the combination of Frogner and McCloghrie fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 1.

Consequently, the Applicants submit that claim 1 would not be made obvious by the teaching of Frogner in view of McCloghrie, and therefore is patentable under 35 U.S.C. § 103. Since claim 8 depends, either directly or indirectly, from claim 1 and recites additional limitations, the Applicants submit that claim 8 is also not made obvious by the teaching of Frogner in view of McCloghrie. Therefore, the Applicants submit that claim 8 also fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder. As such, the Applicants respectfully request the rejection be withdrawn.

D. Claims 11, 14-19, 37 and 38

The Examiner has rejected claims 11, 14-19, 37 and 38 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner in view of Muratani and in further view of Smyth, et al. (U.S. Patent 6,347,224, issued February 12, 2002, hereinafter referred to as "Smyth"). The Applicants note that it appears the Examiner inadvertently left claims 37 and 38 under this rejection as it appears the Examiner separately rejects claims 37 and 38 below under a different combination of references and does not address them in this section of the Office Action. Therefore, the Applicants assume that the Examiner did not attend to reject claims 37 and 38 in this section and will address the rejection of claims 37 and 38 separately in the following sections. Regardless, the Applicants respectfully traverse the rejection.

The teachings of Frogner and Muratani are discussed above. Smyth teaches charging systems for services in communications. In a charging system for cellular communications, real-time prices for new connections are offered to the customer. (See Smyth, Abstract.)

The Examiner's attention is directed to the fact that Frogner, Muratani and Smyth, alone or in any permissible combination fails to teach or suggest the novel concept of a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by Applicants' independent claim 1. (See *supra*.) As discussed above, Frogner only teaches using a sampling frequency that is premised on a

PATENT

Att. Dkt. No. 003493.00360 (ATT/2001-0335)

sensitivity of the network. Muratani only teaches retrieving and processing billing information only when a request is made from a user. (See Muratani, Abstract.) Moreover, Smyth fails to bridge the substantial gap left by Frogner and Muratani. Smyth only teaches offering real-time prices for new connections in a charging system for cellular communications. (See Smyth, Abstract.) Therefore, the combination of Frogner, Muratani and Smyth fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 1.

Consequently, the Applicants submit that claims 1, 37 and 38 would not be made obvious by the teaching of Frogner in view of Muratani and in further view of Smyth, and therefore are patentable under 35 U.S.C. § 103. Since claims 11 and 14-19 depend, either directly or indirectly, from claim 1 and recite additional limitations, the Applicants submit that claims 11 and 14-19 are also not made obvious by the teaching of Frogner in view of Muratani and in further view of Smyth. Therefore, the Applicants submit that claims 11 and 14-19 also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder. As such, the Applicants respectfully request the rejection be withdrawn.

E. Claim 37

The Examiner has rejected claim 37 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner in view of Smyth and Muratani and in further view of McCloghrie. Applicants respectfully traverse the rejection.

The teachings of Frogner, Smyth, Muratani and McCloghrie are discussed above. The Examiner's attention is directed to the fact that Frogner, Smyth, Muratani and McCloghrie, alone or in any permissible combination fails to teach or suggest the novel concept of a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by Applicants' independent claim 37. Specifically, Applicants' independent claim 37 positively recites:

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

37. A method for charging a customer for usage of a data network, comprising the steps of:

- adjusting a probabilistic parameter in accordance with a charging accuracy;
- receiving an object, wherein the object is characterized by a size and a customer;
- determining whether to sample the object in accordance with the probabilistic parameter, wherein the probabilistic parameter approximately optimizes a cost function and wherein the cost function relates the probabilistic parameter to a sampling accuracy and a sampling volume;
- sampling the object in response to said determining step;
- normalizing the sample in response to said sampling step;
- determining the usage for the customer in accordance with said normalizing step;
- adjusting the usage in accordance with the charging accuracy; and
- determining a charge to the customer in response to said adjusting step.

(Emphasis added.)

The Applicants' invention teaches a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter. The Applicants' invention uses a probabilistic parameter that determines the probability that a given flow will be sampled. (See Applicants' specification, e.g., paragraph [42].)

As discussed above, Frogner only teaches using a sampling frequency that is premised on a sensitivity of the network. Moreover, Smyth, Muratani and McCloghrie fail to bridge the substantial gap left by Frogner. Smyth only teaches offering real-time prices for new connections in a charging system for cellular communications. (See Smyth, Abstract.) Muratani only teaches retrieving and processing billing information only when a request is made from a user. (See Muratani, Abstract.) McCloghrie only teaches that the sampling is performed by selecting a control parameter N. (See McCloghrie, col. 4, ll. 41-54.) Thus, one out of every N packets is selected by the sampling element for further processing by the traffic management element. (See *Id.*) Therefore, the combination of Frogner, Smyth, Muratani and McCloghrie fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 37. As such, the Applicants submit that claim 37 fully satisfies the requirements of 35 U.S.C. § 103 and is

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

patentable thereunder. As such, the Applicants respectfully request the rejection be withdrawn.

F. Claim 38

The Examiner has rejected claim 38 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Frogner in view of Muratani and in further view of McCloghrie. Applicants respectfully traverse the rejection.

The teachings of Frogner, Muratani and McCloghrie are discussed above. The Examiner's attention is directed to the fact that Frogner, Muratani and McCloghrie, alone or in any permissible combination fails to teach or suggest the novel concept of a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by Applicants' independent claim 38. Specifically, the Applicants' independent claim 38 positively recites:

38. A method for managing a data network in accordance with a traffic volume, comprising the steps of:  
adjusting a probabilistic parameter for a sampling window in accordance with a targeted sampling volume;  
receiving an object, wherein the object is characterized by a size;  
determining whether to sample the object in accordance with the probabilistic parameter, wherein the probabilistic parameter approximately optimizes a cost function, wherein the cost function relates the probabilistic parameter to a sampling accuracy and a sampling volume;  
sampling the object in response to said determining step;  
normalizing the sample in response to said sampling step;  
determining an estimated traffic volume in accordance with said normalizing step; and  
utilizing the estimated traffic volume to manage the data network.  
(Emphasis added.)

The Applicants' invention teaches a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter. The Applicants' invention uses a probabilistic parameter that determines the probability that a given flow will be sampled. (See Applicants' specification, e.g., paragraph [42].)



PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

As discussed above, Frogner only teaches using a sampling frequency that is premised on a sensitivity of the network. Moreover, Muratani and McCloghrie fail to bridge the substantial gap left by Frogner. Muratani only teaches retrieving and processing billing information only when a request is made from a user. (See Muratani, Abstract.) McCloghrie only teaches that the sampling is performed by selecting a control parameter N. (See McCloghrie, col. 4, ll. 41-54.) Thus, one out of every N packets is selected by the sampling element for further processing by the traffic management element. (See *Id.*) Therefore, the combination of Frogner, Muratani and McCloghrie fail to teach, show or suggest a method for managing a data network, the method comprising the step of determining whether to sample the object in accordance with a probabilistic parameter, as positively claimed by independent claim 38. As such, the Applicants submit that claim 38 fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder. As such, the Applicants respectfully request the rejection be withdrawn.

PATENT

Atty. Dkt. No. 003493.00360 (ATT/2001-0335)

**Conclusion**


Thus, the Applicants submit that claims 1-38 now fully satisfy the requirements of 35 U.S.C. §103. Consequently, the Applicants believe that these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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